



(2 of 2)

PTO/SB/08A (10-01)

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 11

Complete if Known

Application Number	10782,878
Filing Date	February 23, 2004
First Named Inventor	Louis B. Rosenberg
Art Unit	2672
Examiner Name	Unassigned
Attorney Docket Number	IMMR-086/02US

U.S. PATENT DOCUMENTS					
Examiner	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number Kind Code ² (if known)			
FF		2,906,179	09-1959	Bower	
		3,490,059	01-1970	Paulsen et al.	
		3,531,868	10-1970	Stevensen	
		3,875,488	04-1975	Crocker et al.	
		3,890,958	06-1975	Fister et al.	
		3,919,691	11-1975	Noll	
		3,944,798	03-1976	Eaton	
		4,125,800	11-1978	Jones	
		4,148,014	04-1979	Burson	
		4,216,467	08-1980	Colston	
		4,398,889	08-1983	Lam et al.	
		4,448,083	05-1984	Hayashi	
		4,477,043	10-1984	Repperger	
		4,477,973	10-1984	Davies	
		4,550,221	10-1985	Mabuth	
		4,550,617	11-1985	Fraignier et al.	
		4,571,834	02-1986	Fraser et al.	
		4,593,470	06-1986	Davies	
		4,601,206	07-1986	Watson	
		4,632,341	12-1986	Repperger et al.	
		4,638,798	01-1987	Sheldon et al.	
		4,653,011	03-1987	Iwano	
		4,654,648	03-1987	Herrington et al.	
		4,676,002	06-1987	Slocum	
		4,679,331	07-1987	Koontz	
		4,688,983	08-1987	Lindbom	
		4,703,443	10-1987	Moriyasu	
		4,704,909	11-1987	Grahn et al.	
		4,750,487	06-1988	Zanetti	
		4,769,763	09-1988	Trieb et al.	
		4,787,051	11-1988	Olson	
		4,791,934	12-1988	Brunnett	
		4,798,919	01-1989	Miessler et al.	
		4,800,721	01-1989	Cemenska et al.	
		4,803,413	02-1989	Kendig et al.	

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Faranah Fouladi

Date
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01/13/05

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FF		4,811,608	03-1989	Hilton	
		4,819,195	04-1989	Bell et al.	
		4,839,838	06-1989	LaBiche et al.	
		4,849,692	07-1989	Blood	
		4,888,549	09-1989	Affinito et al.	
		4,879,556	11-1989	Duimel	
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		4,891,889	01-1990	Tomelleri	
		4,896,554	01-1990	Culver	
		4,907,970	03-1990	Meenen, Jr.	
		4,907,973	03-1990	Hon	
		4,935,728	06-1990	Kley	
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		4,945,501	07-1990	Bell et al.	
		4,961,138	10-1990	Gorniak	
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		4,962,591	10-1990	Zeller et al.	
		4,982,504	01-1991	Soderberg et al.	
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		5,007,085	04-1991	Greanias et al.	
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		5,040,306	08-1991	McMurtry et al.	
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		5,095,303	03-1992	Clark et al.	
		5,103,404	04-1992	McIntosh	
		5,107,080	04-1992	Rosen	
		5,116,051	05-1992	Moncrief et al.	
		5,116,180	05-1992	Fung et al.	
		5,126,948	06-1992	Mitchell et al.	

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FF		5,128,671	07-1992	Thomas, Jr.	
		5,131,844	07-1992	Marinaccio et al.	
		5,132,672	07-1992	Clark	
		5,139,261	08-1992	Openiano	
		5,142,506	08-1992	Edwards	
		5,142,931	09-1992	Menahem	
		5,143,505	09-1992	Burdea et al.	
		5,146,566	09-1992	Hollis, Jr. et al.	
		5,148,377	09-1992	McDonald	
		5,178,012	01-1993	Culp	
		5,181,181	01-1993	Glynn	
		5,182,557	01-1993	Lang	
		5,184,306	02-1993	Erdman et al.	
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		5,187,874	02-1993	Takahashi et al.	
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		5,220,260	06-1993	Schuler	
		5,223,776	06-1993	Radke et al.	
		5,228,356	07-1993	Chuang	
		5,230,623	07-1993	Guthrie et al.	
		5,235,868	08-1993	Culver	
		5,243,266	09-1993	Kasagami et al.	
		5,251,127	10-1993	Raab	
		5,251,156	10-1993	Heier et al.	
		5,259,120	11-1993	Chapman et al.	
		5,259,894	11-1993	Sampson	
		5,262,777	11-1993	Low et al.	
		5,264,768	11-1993	Gregory et al.	
		5,275,565	01-1994	Moncrief	
		5,289,273	02-1994	Lang	

Examiner Signature	<i>Faramak Fouladi</i>	Date Considered	01/13/05
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		Art Unit	2672
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		Number Kind Code ² (if known)			
FF		5,298,848	03-1994	Ledley	
	1	5,341,459	08-1994	Backes	
		5,354,162	10-1994	Burdea et al.	
		5,379,663	01-1995	Hara	
		5,384,460	01-1995	Tseng	
		5,389,865	02-1995	Jacobus et al.	
		5,396,266	03-1995	Brimhall	
		5,396,267	03-1995	Bouton	
		5,397,323	03-1995	Taylor et al.	
		5,402,582	04-1995	Raab	
		5,405,152	04-1995	Katanics et al.	
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		5,414,337	05-1995	Schuler	
		5,417,696	05-1995	Kashuba et al.	
		5,428,748	06-1995	Davidson et al.	
		5,429,140	07-1995	Burdea et al.	
		5,436,542	07-1995	Petelin et al.	
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		5,445,166	08-1995	Taylor	
		5,451,924	09-1995	Massimino et al.	
		5,459,382	10-1995	Jacobus et al.	
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		5,512,919	04-1996	Araki	
		5,513,100	04-1996	Parker et al.	
		5,513,100	04-1996	Parker et al.	
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		5,550,562	08-1996	Aoki et al.	
		5,551,701	09-1996	Bouton et al.	
		5,570,111	10-1996	Barrett et al.	
		5,576,727	11-1996	Rosenberg et al.	
		5,589,854	12-1996	Tsai	
		5,591,924	01-1997	Hilton	
		5,596,347	01-1997	Robertson et al.	
V		5,623,582	04-1997	Rosenberg	

Examiner Signature	<i>Foranau Pauladi</i>	Date Considered	01/13/05
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FF		5,625,576	04-1997	Massie et al.	
		5,629,594	05-1997	Jacobus et al.	
		5,642,469	06-1997	Hannaford et al.	
		5,643,087	07-1997	Marcus et al.	
		5,666,138	09-1997	Culver	
		5,666,473	09-1997	Wallace	
		5,691,898	11-1997	Rosenberg et al.	
		5,709,219	01-1998	Chen et al.	
		5,714,978	02-1998	Yamanaka et al.	
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		5,767,839	06-1998	Rosenberg	
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		5,802,353	09-1998	Avila et al.	
		5,805,140	09-1998	Rosenberg et al.	
		5,808,601	09-1998	Leah et al.	
		5,825,308	10-1998	Rosenberg	
		5,831,408	11-1998	Jacobus et al.	
		5,844,392	12-1998	Peurach et al.	
		5,889,670	03-1999	Schuler et al.	

Examiner Initials*	Cite No. ¹	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code ³	Number ⁴ Kind Code ⁵ (if known)			
FF		JP	4-34610			
		GB	2254911			
		WO	9520787			
		WO	9616397			
		WO	9622591			

Examiner Signature	<i>Farouk Fula</i>	Date Considered	01/13/05
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FF ↓ ↓ ↓ ↓ ↓ ↓		WO	9842078				
		EP	0626634	A2			
		EP	0875819	A1			
		WO	9502801				
		WO	9520788				
		WO	9532459				
		WO	9731333				

Examiner Signature	Foranah Bouladi	Date Considered	01/13/05
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Sheet	7	of	11	Attorney Docket Number	IMMR-086/02US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
FF		Cursor Walso, "Designer's Corner-Useful Technology for Your Idea File," Design News, Mar. 7, 1993, p. 63.	
		"Foot-Operated Mouse," IBM Technical Disclosure Bulletin, Apr. 1986, vol. 28, No. 11.	
		"High Performance Model of the Immersion Probe," Immersion Probe-MD.TM., Immersion Corporation (1994).	
		"Proceedings of the IFIP Congress 65," International Federation for Information Processing, Information Processing 1965, vol. 3, New York, May 24-29, 1965, p. 506.	
		"The Personal Digitizer.TM.," Immersion Human Interface Corporation 1994.	
		"Useful Technology for Your Idea File," Design News, Mar. 7, 1994, p. 63.	
		3D Human Interface Tool, Immersion Probe.TM., Immersion Human Interface Corporation 1994.	
		Adachi, Yoshitaka et al., "Sensory Evaluation of Virtual Haptic Push-Buttons," Technical Research Center, Suzuki Motor Corporation, Nov. 1994.	
		Adelstein Bernard D. et al., "A High Performance Two Degree-of-Freedom Kinesthetic Interface," Massachusetts Institute of Technology 1992, pp. 108-112.	
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		Atkinson, W. et al., "Computing with Feeling," Comp. & Graphics, vol. 2, 1976, pp. 97-103.	
		Batter, James J. et al., "Grove-1: A Computer Display to the Sense of Feel," pp. TA-4-188-TA-4-192.	
		Bejczy et al., "The Phantom Robot: Predictive Displays for Teleoperation with Time Display," CA Institute of Technology, IEEE 1990, pp. 546-550.	
		Brooks Jr., Frederick et al., "Project GROPE-Haptic Displays for Scientific Visualization," Computer Graphics, vol. 24, No. 4, 1990, pp. 177-185.	
✓		Burdea, Grigore et al., "A Portable Dextrous Master with Force Feedback," Presence: Teleoperators and Virtual Environments, MIT Press, Jun. 1991.	

Examiner Signature	<i>Paranah Foula</i>	Date Considered	01/13/05
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FF		Burdea, Grigore et al., "Dextrous Telerobotics with Force Feedback-An Overview," Robotica 1991, vol. 9.	
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Examiner Signature	<i>Faranak Fouladi</i>	Date Considered	01/13/05
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Substitute for form 1449A/PTO		Complete If Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/782,878
		Filing Date	February 23, 2004
		First Named Inventor	Louis B. Rosenberg
		Art Unit	2672
		Examiner Name	Unassigned
Sheet 9 of 11	Attorney Docket Number	IMMR-086/02US	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
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Examiner Signature	Foranek Fouladi	Date Considered	01/13/05
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Examiner Signature	<i>Faronak Fouladi</i>	Date Considered	01/13/05
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Examiner Signature	<i>Farouk Farouki</i>	Date Considered	01/13/05
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Sheet 1 of 3

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U.S. PATENT DOCUMENTS

Examiner	Cite No. ¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code ² (if known)			
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Parvaneh Foubadi

Date
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Examiner Signature	Faranak Kalladi		Date Considered 1/13/05

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FF	A1	6,292,170	B1	Chang et al.	09-18-2001	
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			Application Number		
			Filing Date	February 23, 2004	
			First Named Inventor	Louis B. ROSENBERG	
			Group Art Unit		
Examiner Name					
Sheet	2	of	3	Attorney Docket Number	IMMR-086/02US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS				
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FF	C1	Balgrie, "Electric Control Loading – A Low Cost, High Performance Alternative," <i>Proceedings of Interservice/Industry Training Systems Conference</i> , pp. 247-254, November 6-8, 1990		
	C2	Iwata, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp. 287-292, 1993		
	C3	Russo, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," <i>MIT Libraries Archives</i> pp. 1-131, May 1990, archived 8/14/90		
	C4	Brooks et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," <i>JPL Publication 85-11</i> , NASA-CR-175890; N85-28559, pp. 1-84, 03/11/1985		
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	C6	Burdea et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," <i>1993 IEEE International Conference on Robotics and Automation</i> , pp. 25-44, 05/02/1993		
	C7	Snow et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. NPO-17851; JPL Case No. 7348, pp. 1-4 with 45 pages of attachments, 06/15/1989		
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	C9	Tadros, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators," <i>MIT Archive</i> , pp. 1-88, February 1990, archived 8/13/90		
	C10	Caldwell et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993		
	C11	Adelstein et al., "Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 1-12, 1992		
	C12	Gotow et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WAI1-11.00, pp. 332-337		
	C13	Stanley et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 55-61, ASME 1992		
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	C16	Patrick et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," <i>Cooperative Intelligent Robotics in Space</i> , Rui J. deFigueiredo et al, Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990		
	C17	Adelstein, "A Virtual Environment System For The Study of Human Arm Tremor," <i>Ph.D. Dissertation</i> , Dept. of Mechanical Engineering, MIT, June 1989, archived 3/13/90		
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	C19	Bejczy et al., "Generalization of Bilateral Force-Reflecting Control of Manipulators," <i>Proceedings Of Fourth CISM-IFTOMM</i> , Sep. 8-12, 1981		
	C20	McAfee et al., "Teleoperator Subsystem/Telerobot Demonstrator: Force Reflecting Hand Controller Equipment Manual," <i>JPL 1988</i> , JPL D-5172		
	C21	Minsky, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," <i>Ph.D. Dissertation</i> , MIT, June 1995, archived 7/6/95		
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	C24	IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990		
	C25	Terry et al., "Tactile Feedback In A Computer Mouse," <i>Proceedings of Fourteenth Annual Northeast Bioengineering Conference</i> , University of New Hampshire, March 10-11, 1988		
	C26	Howe, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," <i>Proceedings of the 1992 IEEE International Conference on Robotics and Automation</i> , Nice, France, May 1992		
	C27	Eberhardt et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," <i>IEEE Virtual Reality Annual International Symposium</i> , Seattle, WA, Sep. 18-22, 1993		

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	C28	Rabinowitz et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contractor area," <i>Journal of The Acoustical Society of America</i> , Vol. 82, No. 4, October 1987	
	C29	Bejczy et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," <i>International Computer Technology Conference, The American Society of Mechanical Engineers</i> , San Francisco, CA, August 12-15, 1980	
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↓	C33	Bejczy, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987	

Examiner Signature	<i>Faramak Fouladi</i>	Date Considered	<i>01/13/05</i>
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